

ends becoming gradually diminished in length, until it constitutes little more than a transverse line, and the muscular belly being proportionally drawn out. Perhaps, as in the case of other cicatrices, a marked degree of shortening would occur if the newly formed tendon were not kept on the stretch. But in the analogous case of ligamentous union after fracture of the patella, the new tissue, as every one knows, is only too apt to lengthen out; and it is not impossible, by judicious management, to obviate almost entirely the tendency to contraction in the scars formed in the healing of burns. We are, therefore, inclined to think that the new material thrown out after tenotomy follows the general law of cicatrices to some extent, and that in so doing it draws out the muscular bellies concerned, so as to extend their sphere of action, or in other words, that the fleshy and tendinous parts of each muscle act and react upon one another, the contracting cicatrix of the tendon pulling upon the fleshy belly, and the latter again by its tonicity opposing the shortening of the former.

Complete non-union of the divided ends Mr. Adams thinks to be of rare occurrence, except in tendons which have no distinct cellular sheath; he has never met with it in the tendo-Achillis. It usually depends either on some defect of constitution in the patient, or upon injudicious treatment. The extension should always be regulated by the degree of activity of the reparative process, especially in non-congenital and paralytic cases.

The greatest length of new tendon which Mr. Adams has ever seen, was two inches and a quarter. He thinks that the required length in any case is not to be procured by a process of stretching, but that it may be regulated by the position given to the parts. The degree to which the deformity is remedied is, therefore, determined at the end of the time (from two to six or eight weeks), required for the construction of the new material between the divided ends. Relapses are due, not to any absorption of the newly formed tendon, but to changes in the muscular tissue.

In Part II. of this essay, Mr. Adams republishes in full some experiments on rabbits, an abstract of which may be found in the *Transactions of the London Pathological Society* for 1855. They seem to bear out the views already mentioned as defended by him with regard to the healing of human tendons after divisions. Not the least valuable part of this volume is contained in the appendix; which embraces a summary of the observations recorded by Hunter, Delpech, Mayo, Stromeyer, Bonvier, Von Arnim, Duval, Little, Guérin, Velpeau, Pirogoff, Dieffenbach, Phillips, Koerner, Tamplin, Paget, Gerstaecker, Thierfelder, Boner, Brodhurst, and Coote, upon the tendons of the human subject as well as of the lower animals. Independently of the practical character of Mr. Adams' work, this portion of it would render it important to those interested in the subject of tenotomy.

A series of five very admirably executed lithographs, representing the appearances observed in the dissections described in the text, and two others showing the microscopic characters of the new material, add greatly to the value of this essay.

J. H. P.

ART. XXV.—*Journal de la Physiologie de l'Homme et des Animaux.* Publiée sous la direction du Docteur E. BROWN-SÉQUARD. Numéros vi. vii. viii. ix. x. xi., 1859—1860.

WE have placed at the head of this notice all those numbers of M. Brown Séquard's journal which have been published since we last called attention to his valuable periodical. We have done so, not for the purpose of citing in succession all the memoirs therein contained—for the mere mention of them would occupy several pages—but in order that we might subject to analysis such papers in all of them as, from their scientific importance or practical value, were likely to prove especially interesting to our readers.

In the first of the above named numbers there is a memoir, by M. CLAUDE BERNARD, on "*Glycogene in its Relation to Tissue-Development in the Fetus before*

*the Appearance of the Glycogenic Function of the Liver.*" which contains the results of additional observations on this subject with which M. Bernard's name is so inseparably connected. It will be recollected that in a former memoir, M. Bernard pointed out that before the development of the liver, the sugar-forming function is performed by the placenta and its annexes. It was also stated that the glycogenic matter is found in other organs and parts of the fœtus. The object of the present communication—which was originally made to the Academy of Sciences—is to indicate definitely these organs.

M. Bernard divides them into two classes: 1st. The exterior or limiting organs, as the skin and mucous membranes. 2d. The interior or continued organs, as the bones, muscles, nerves, &c. In regard to the first class, he finds that all the epithelial membranes of the skin and mucous surfaces contain glycogenic matter at a certain period of fetal life. On the cutaneous surface this substance is found infiltrated into the tissue of the skin itself, and also into the epithelial cells which cover it. In the hog this disposition is well marked; but in the rabbit, the cat, and the calf, it is perceived with some difficulty. In order to establish the existence of glycogenic matter in this tissue, it is only necessary to scrape the surface of the skin of a young fœtus, and to place the detached particles in the field of the microscope. Cells and histological products of various forms are met with, and also granules which, by the action of acidulated tincture of iodine, are coloured red. These granules are the glycogenic matter. On the mucous surfaces of the intestines, the respiratory passages, and the genito-urinary channels, the same substance is to be found.

Among the tissues of the second class, the glycogenic matter is met with in the muscles alone. In the bones, the nerves, and the glandular organs, it is not found. An exception exists among these latter—the liver. In the early stage of fetal existence it follows the same law as the other glands, but with the progressive development of the fœtus it acquires the faculty of forming both bile and glycogenic matter.

M. Bernard is of opinion that this glycogenic matter plays an important part in the organic development of the fœtus, but he thinks additional experiments are necessary before we can arrive at any exact conclusions relative to the subject.

In the seventh number, M. BROWN-SÉQUARD calls attention to a memoir published by him, ten years since, on the *Influence of an Elevated Temperature as a Therapeutic Means in certain Cases of Poisoning, &c.*, which we think worthy of consideration. We have several times had occasion to notice the fact which he mentions, that a smaller dose of poison will kill an animal when the temperature is low, than can cause this result when the heat is kept above the standard by artificial means. Some experiments of Dr. S. Weir Mitchell, which are not yet published (and to which, therefore, we do not feel at liberty to refer at length), sufficiently show the therapeutic influence of a high temperature to be very well marked.

In the ninth number, M. OLLIER continues his interesting researches relative to the growth of bone. The present memoir considers the question under three heads: 1st. The transplantation of bone taken from a living animal and placed among the tissues of an animal of the same species. 2d. Transplantation of bone taken from a dead animal, after a certain lapse of time, and placed among the tissues of an animal of the same species. 3d. Transplantation of bone taken from a living animal and placed among the tissues of animals of different species.

Many experiments are adduced under each of these heads. We cite the following, which relates to the first division of the subject:—

"*Exp. 1. Transplantation of the radius of a rabbit, four or five weeks old, under the skin of the groin of a rabbit, five or six months old.*" The operation was performed December 27th, 1858. The periosteum was preserved throughout the whole extent of the radius. Immediate reunion of the wound was obtained, and the animal, under the skin of which the radius was placed, did not appear to feel the operation. There was a little swelling during the first few days after the operation. The animal was killed on the 1st of March, 1859, and the following facts were observed:—

"The graft had succeeded perfectly. The bone was united to the skin by a

cellular fascia, which was blended more or less with its periosteum, and which kept it in place. It had increased in size both in its vertical and transverse diameters since it had been transplanted. The precaution which had been taken to preserve the radius of the opposite side, permitted the exact augmentation to be ascertained. The rabbit, from which the radius was taken, was killed the same evening of the operation. When the two bones were placed side by side, it was immediately seen that the transplanted bone had sensibly increased in size. When the periosteum and cellular tissue which surrounded it were removed, it was immediately seen that the increase was due to the formation of extensive layers through the action of the periosteum. These layers—or rather this layer, for the naked eye could not separate them—were deficient in certain places corresponding exactly to those where the periosteum presented solutions of continuity. It was whiter than the old bone, and seemed constituted of a more compact substance.

"The old part of the transplanted bone had almost preserved its natural colour. It was sensibly vascular, and moreover was evidently continuous with the layer of new formation which surrounded it. The medullary canal had not undergone any notable alteration. The marrow was not so red as in the normal state, but it should be remembered that it was examined after the piece had been some hours in water.

"The increase in length was a little less than a millimetre. It appeared at first to be much more considerable, but after having stripped off all the cellular tissue which surrounded it, it was perceived that the real was not the same as the apparent increase. This increase appeared to belong both to the diaphysis and epiphysis. These portions of the bone were not united together—they are always separated by an intermediate plate of cartilage. The extremities were hard and of osseous consistence. The articular cartilages were deprived of their polish."

The different phenomena observed are next discussed, and then the other divisions of the subject are proceeded with.

As the main result of the transplantation of bones taken from dead animals, it was found that the vitality of the periosteal and osseous tissues did not disappear with the life of the animal, and that the graft was accordingly successful, if not too long delayed. After the cessation of respiration and of circulation, after the interruption of nervous influence, the bone still preserves for a certain time a latent life which becomes sensible if it is placed in favorable relations. Transplantation under the skin of another animal furnishes the means by which it can continue to live. Its resistance to absorption, its growth, and its vascularity, proven by injections, are sufficient proofs of its vitality. The principal power of re-vivification is possessed by the periosteum. If this be removed, the bone dies.

The experiments of the third class were not so successful as those above referred to, and M. Olliver is of opinion that further investigations are necessary.

The eleventh number contains a paper, in English, by Dr. B. W. Richardson, on the "Synthesis of Cataract"—a continuation of the experiments originated by Dr. S. W. Mitchell. This paper has already been noticed in our journal.

As we remarked at the commencement of this notice, it would be impossible for us to call attention to all the admirable memoirs contained in the numbers before us. To do so would require more space than we have at our command. In addition to the original papers, there are a number of valuable translations and abstracts which add materially to the value of the periodical.

In conclusion, we can only say, what we have already said several times before, that the *Journal de Physiologie* is of great service to science, and that it is fairly entitled to occupy the prominent position it does in the medical literature of Europe.

W. A. H.